Remarks:

Reconsideration of this application in view of the following remarks is respectfully requested. Claims 1-8 and 10-13 are pending and under examination. Claims 1, 5 and 11 have been currently amended (no new matter has been added); claim 9 has been cancelled; and claims 2-4, 6-8, 10, 12, and 13 have been previously presented. Claims 1-3, 6, and 13 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,693,678 to Von Volki. Claims 1-8, 10-13 stand rejected under 35 U.S.C. § 103(a) as being obvious for the reasons of record. Applicant respectfully disagrees and traverses each ground of rejection. For purposes of clarity, Applicant addresses each of the Examiner's concerns in the order set forth in the Office Action.

As an initial matter, however, Applicant wishes to reiterate that his invention is directed to a novel method for forming a hollow composite part having one or more selectively positioned core, structural insert, or veneer pieces integrally associated therewith. In accordance with the inventive method (and unlike the prior art), a mandrel is provided that has one or more selectively positioned recesses that are complementary to the one or more core, structural insert, or veneer pieces. Applicant's specification expressly discloses the following passages relevant to the meaning of the presently recited claim limitation "complementary":

> In this method, a mandrel 10 is provided that defines a shape that is substantially the same but sized just a bit smaller than the desired shape of the part to be formed. The mandrel 10 further includes one or more selectively positioned recesses 12 that are complementary to the one or more core, structural insert, or veneer pieces 14 (meaning the recesses 12 are adapted to receive the core, structural insert, or veneer pieces).

Specification at pages 7, lines 16-21 (*emphasis added*).

> Unlike the methods known in the prior art, the selectively positioned recesses 12 imprinted into the mandrel 10 allows for consistent and uniform placement of the core, structural insert, or veneer pieces 14 with respect to the part to be formed.

Specification at pages 8, lines 28-29.

In view of the Examiner's rejections, it appears that the claim term "complementary" has either been ignored or not properly construed. Accordingly, Applicant wishes to remind the Examiner that where an explicit definition is provided by an applicant for a term, that

definition will control interpretation of the term as it is used in the claim. *Toro Co. White Consolidated Industries Inc.*, 199 F.3d 1295, 1299, 53 USPQ2d 1065, 1067 (Fed. Cir. 1999) ("[W]ords in patent claims are given their ordinary meaning in the usage of the field of the invention, unless the text of the patent makes clear that a word was used with a special meaning.")

Claims 1-3, 6, and 13 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,693,678 to Von Volki. In this regard, the Examiner has seemingly taken the position that the "holes/recesses (22)" taught by Von Volki are complementary to "other materials such as honeycomb core (60) and machining prepreg plies (56)" because these material "can be positioned adjacent and proximate to the holes/recesses defined in the mandrel." Office Action at page 2, last paragraph. In so doing, the Examiner reaches for the conclusion that the method taught by Von Volki is the same as the method of the present application. Applicant respectfully disagrees and submits that the "vacuum grooves 22" taught by Von Volki are not recesses that are complementary to a later added piece of core, structural insert, or veneer. In fact, the vacuum grooves 22 taught by Von Volki are for applying a vacuum, and are not in any instances shaped or sized to receive a later added piece of core, structural insert, or veneer.

In contradistinction, and unlike the methods known in the prior art, the selectively positioned recesses associated with the present invention allows for the consistent and uniform placement of core, structural insert, or veneer pieces (with respect to the part to be formed) because these recesses are appropriately sized and shaped (to receive the core, structural insert, or veneer pieces). It therefore necessarily follows that U.S. Patent No. 4,693,678 to Von Volki does not anticipate the presently claimed invention. Accordingly, Applicant respectfully requests that the Examiner's anticipation rejections be withdrawn.

Claims 1-3, 5-8, and 10-13 have been rejected under 35 U.S.C. § 103(a) as being obvious in view of U.S. Patent 4,202,856 to Frikken *et al.* in further view of U.S. Patent No. 6,458,306 to Nelson and either U.S. Patent No. 3,989,562 to Hladik *et al.* or U.S. Patent No. 6,613,258 to Maison *et al.* More specifically, the Examiner has taken the position that U.S. Patent No. 4,202,856 to Frikken *et al.* teaches "the basic claimed process of manufacturing a hollow-graphite composite structural part wherein a mandrel

having an external configuration similar but smaller than the configuration of the part to be produced is encased by a superimposed flexible bag forming an elastic bladder about the mandrel (col. 1, lines 5-16)." The Examiner goes on to note that Frikken *et al.* does "not disclose employment of a vacuum between the bladder and the mandrel nor do they disclose providing a mandrel with recesses and positioning a core, structural insert or a veneer piece adjacent and proximate [to] one of the recesses." Office Action at pages 3-4, spanning paragraph.

Applicant agrees with the Examiner that U.S. Patent 4,202,856 to Frikken *et al.* does not teach or suggest (1) employing a vacuum between the bladder and the mandrel, and (2) providing a mandrel having one or more selectively positioned recesses that are complementary to one or more core structural insert, or veneer pieces. In order to overcome these shortcomings, the Examiner asserts that U.S. Patent No. 6,458,306 to Nelson *et al.* teaches employing a vacuum between a bladder and a mandrel, and that U.S. Patent No. 3,989,562 to Hladik *et al.* and U.S. Patent No. 6,613,258 to Maison *et al.* both teach the use of mandrels/formers with recesses and positioning reinforcing materials/stiffeners adjacent and proximate to the recesses. Office Action page 4, second paragraph. In view of the combined teachings of these references, the Examiner goes on to erroneously conclude:

> Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to employ a vacuum between the bladder and the mandrel as disclosed by Nelson while practicing the method of Frikken et al. for the purpose, as taught by Nelson, of having the bladder conform to the mandrel core (col. 12, lines 62-65) and to employ a mandrel/former with recesses and positioning reinforcing materials/stiffeners adjacent and proximate [to] the recesses, as taught individually by both Hladik et al. and Maison et al. for the purpose, as taught by Hladik et al., for example, of increasing the strength and rigidity of the hollow article (col. 1, lines 42-45).

Office Action at pages 4-5, spanning paragraph.

Applicant respectfully disagrees with the Examiner's syllogism because combining and/or modifying the various references in the manner proposed by the Examiner (1) would have had no reasonable expectation of success, and (2) would necessarily render the primary reference (*i.e.*, U.S. Patent No. 4,202,856 to Frikken *et al.*)

unsatisfactory for its intended purposes. Accordingly, Applicant traverses these grounds of rejection.

In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). In addition, if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there can be no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

With regards to the Examiner's obviousness rejections, the Examiner seemingly contends that the hollow multi-piece mandrels/formers taught by both Hladik *et al.* and Maison *et al.* would be suitable for use with the solid dissolvable mandrel method taught by Frikken *et al.* Applicant respectfully disagrees with this contention because (1) such a combination would have no reasonable expectation of success, and because (2) such a combination would necessarily render the method taught by Frikken *et al.* unsatisfactory for its intended purpose (namely, to manufacture hollow graphite-epoxy structural parts without the use of an autoclave or other high external pressure equipment). (Note: Frikken *et al.* expressly teaches "[a] novel method . . . for the manufacture of a hollow graphite-epoxy structural part with high composite density and using tooling that eliminates the necessity of autoclave and similar high external pressure curing equipment" Abstract, first sentence (*emphasis added*).)

First, Applicant asserts that the combination of references contemplated by the Examiner would have no reasonable expectation of success because the multi-piece hollow mandrels/formers taught by both Hladik *et al.* and Maison *et al.* would not in any instances be suitable for placement and subsequent curing within a pressurized split mold as is required by the presently claimed invention. Rather, the hollow mandrels/formers taught by both Hladik *et al.* and Maison *et al.* are massive structures that are not, under

any circumstances, suitable or otherwise amenable to placement within the relatively small confines of a split mold cavity; nor are they suitable to pressurization (because hollow mandrels/formers would collapse under pressure). Indeed, the wound transportation container bodies taught by Hladik *et al.* are relatively large structures, and the hollow mandrels/formers used to construct such large structures have several parts and are collapsible (col. 3, lines 58-64). Similarly, the fuselage segments taught by Maison *et al.* are likewise relatively large structures, and the hollow mandrels used to construct such large structures have several parts and are readily disassemblable (col. 6, lines 57-61). Moreover, the multi-piece hollow mandrels/formers taught by both Hladik *et al.* and Maison *et al.* are very dissimilar to the dissolvable solid mandrels required by the presently claimed invention. Therefore, Applicant respectfully submits that those skilled in the art would conclude that the combination suggested by the Examiner would have no reasonable expectation of success.

Second, Applicant further asserts that the combination of references contemplated by the Examiner would necessarily render the method taught by Frikken *et al.* unsatisfactory for its intended purpose. In this regard, the intended purpose of the method taught by Frikken *et al.* is to manufacture hollow graphite-epoxy structural parts without the use of an autoclave or other high external pressure equipment. With this purpose in mind, Applicant submits that because the relatively large structures taught by both Hladik *et al.* and Maison *et al.* are not amenable to placement within a split mold for subsequent heating and curing, they would necessarily need to either be self-cured (*i.e.*, without employing a subsequent heating step) or be cured with the assistance of an autoclave or heated pressure vessel as is appreciated by those skilled in the art. Therefore, Applicant respectfully submits that those skilled in the art would conclude that the combination suggested by the Examiner would render the method taught by Frikken *et al.* unsatisfactory for its intended purpose.

In order to obtain allowance notwithstanding the foregoing arguments, Applicant has elected to further limit the scope of his invention to further patentably distinguish his claimed subject matter over the prior art. More specifically, Applicant has amended claim 1 such that it now recites "a dissolvable solid mandrel" (support found, for example, at page 7, lines 23-29 of the Specification) and "a split mold" (support found, for example, at page 9, lines 5-9 of the Specification) and "liquefying and removing the

mandrel from within the composite material part" (support found, for example, at page 9, lines 14-17 of the Specification). In so doing, Applicant's claimed invention is now clearly patentably distinguishable over the prior art of record for the reasons noted above. Accordingly, Applicant respectfully requests that the Examiner's obviousness rejections be withdrawn.

In view of the above remarks and claim amendments allowance of claims 1-8 and 10-13 is earnestly solicited. A good faith effort has been made to place this application in condition for allowance. If any further matter requires attention prior to allowance, the Examiner is respectfully requested to contact the undersigned attorney at (206) 568-3100 to resolve the same.

Respectfully submitted,

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